Received - 9 September 2024
Planning Applications Group

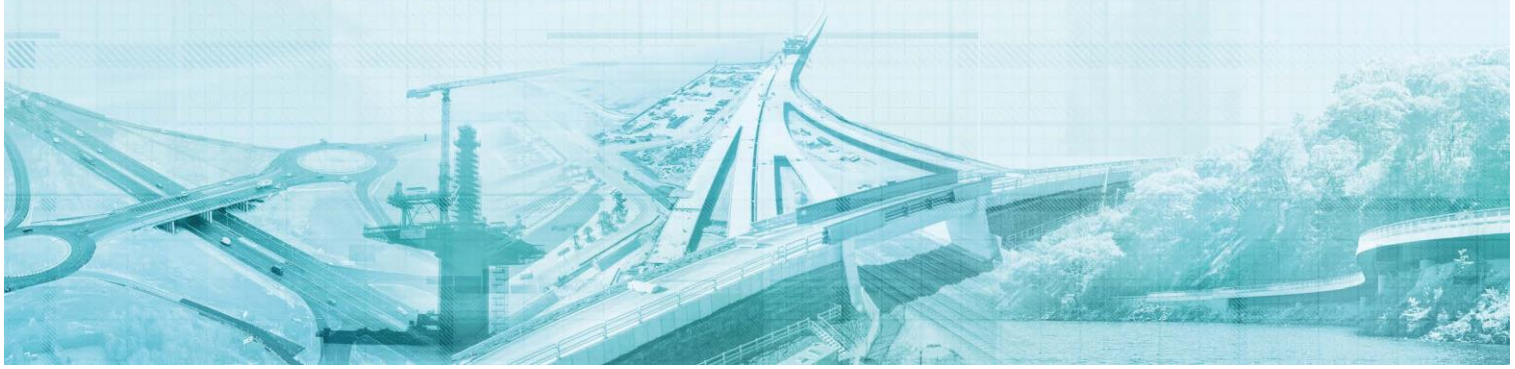
Bean Tunnel

Departures Report

Kent County Council

Document no: BRT-TG-XX-ZZ-RP-HI-0101

Revision: P01 Date: 04/02/2021



This page is intentionally left blank

Document Issue Record

Project:	Bean Tunnel
Report Title:	Departures Report
Client:	Kent County Council
Document No:	BRT-TG-XX-ZZ-RP-HI-0101
Revision:	P01
Status	S3 – Suitable for Review/Comment
Date:	04/02/2021
Filename:	BRT-TG-XX-ZZ-RP-HI-0101

Rev	Date	Description and Purpose of Issue	Prepared	Reviewed	Approved
P01	04/02/21	For review and comment	MS	LD	MJH

Issuing Office:	Tony Gee and Partners LLP, Hardy House, 140 High Street Esher, Surrey, KT10 9QJ
Tel:	+44 1372 461600
Email:	esher@tonygee.com

Contents

1. Introduction 2
1.1. Background 2
1.2. Contact Details 3
2. Design Standards 3
2.1. General Layout and Design 3
2.2. Horizontal Alignment 4
2.3. Vertical Alignment 4
2.4. Stopping Sight Distance 4
3. Departure reference D/BRT/HI/01 5

Appendix

Appendix A – Supporting Drawings

Departure from Standard Signature Page

Departure Reference.	Approved/Rejected	Comments/ Mitigation/ Essential Compensatory Measures
D/BRT/HI/01		
Signed		
Print		
Job Title		
Date		
Signed		
Print		
Job Title		
Date		

1. Introduction

1.1. Background

Plans are underway for a Garden City at Ebbsfleet (east of Bluewater Shopping Centre, Dartford), with an expected provision of up to 15,000 new homes based predominantly in brownfield land (former quarries).

Kent County Council has proposed for a Fastrack bus service, to connect these new developments to existing housing, businesses and leisure locations in Dartford.

Bean Tunnel is a proposed development to provide a Fastrack busway and a shared footway/cycleway route linking Eastern Quarry (proposed location for the Garden City) and Bluewater. This development will comprise of a new bore tunnel (Bean Tunnel) and associated road works to include bi-directional bus, cycling and pedestrian access between Eastern Quarry and Bluewater. The new tunnel will run through the chalk spine, under the existing B255 route. The site location plan is shown in Figure 1.

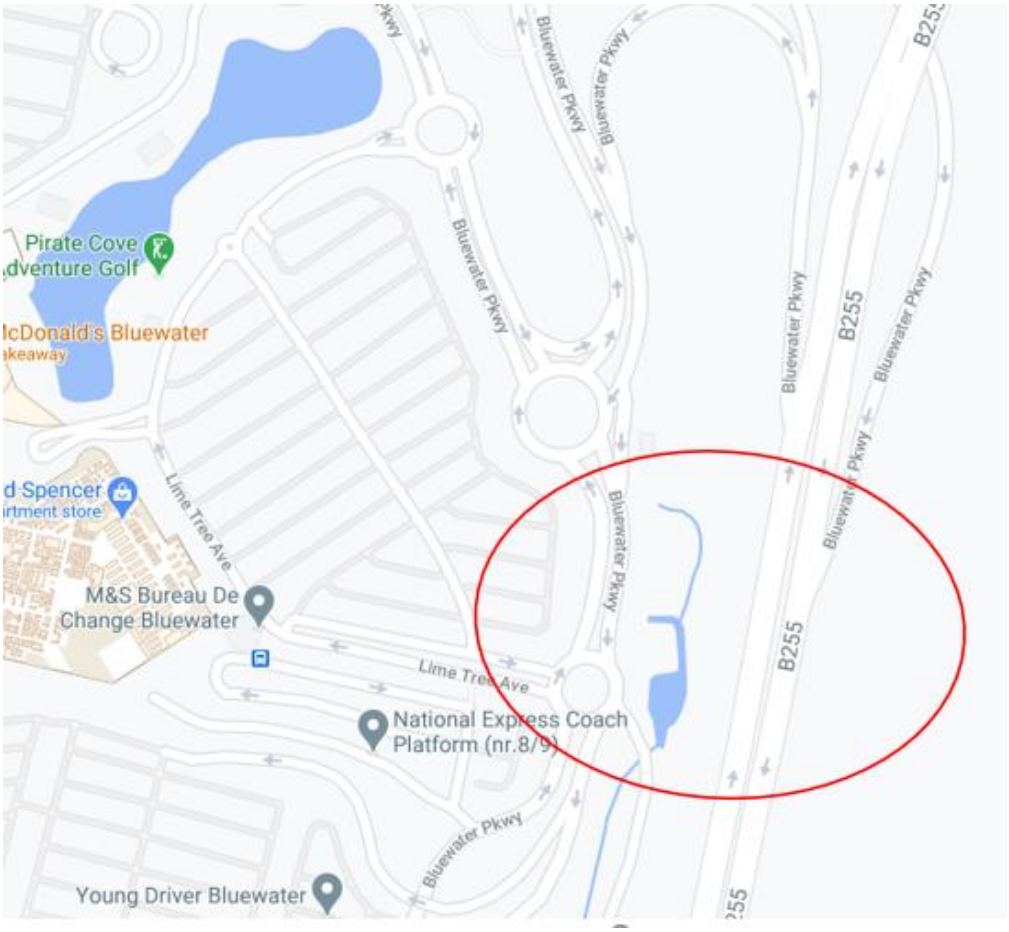


Figure 1 - Site Location Plan

The existing northbound Bluewater Parkway road, which links the Northern and Southern roundabout, will be widened from two lanes to incorporate a third lane assigned for bus only use. Other associated works to take place will include new signage, signalling, lighting,

landscape, and drainage works together with connecting highway junctions at each end, including utilities.

Two haulage tunnels were constructed through the chalk spine supporting B255 Bean Road to facilitate earthworks movements during the construction of Bluewater Shopping Centre during the mid-1990s. These are located to the south of the proposed new Bean Tunnel, which are currently not in use but are inhabited by bats. There are proposals to retain one of the tunnels for bat conservation and to infill the other tunnel, to reduce maintenance and potential risk of exposure to unauthorised access.

Currently a pond is located to the west side of the new tunnel. A wildlife corridor and twin pipes are proposed to go cross underneath the road to maintain water flow and wildlife movement in the pond. Twin pipes are proposed on the east side of the tunnel where there is an assumed swale running adjacent to the B255.

Further works include tree planting at land adjacent to lake 5 (west of Bluewater Retail Park), to compensate for the loss of trees, to ensure there is no net loss.

1.2. Contact Details

PROJECT NAME	Bean Tunnel
APPLICANT ORGANISATION	Tony Gee and Partners LLP
CONTACT DETAILS	Matthew Hammonds (Highways Director) matthew.hammonds@tonygee.com Hardy House, 140 High St, Esher, Surrey, KT10 9QJ Tel: 01372 461669
APPLICANT REF	
HIGHWAY AUTHORITY REF	
DATE SUBMITTED	04/02/2021

2. Design Standards

2.1. General Layout and Design

The Design Speed of the widened highway and new tunnel is to match existing at 48kph. The proposed Speed Limit within the tunnel is 20mph.

2.2. Horizontal Alignment

The horizontal alignment of the highway has been designed to comply with the requirements of CD 109 Revision 1 – Highway Link Design or derived from stopping sight distances from the Manual for Streets, unless noted otherwise within this Departure Report.

Non-motorised user routes are provided on either side of the tunnel in the form of a 3.5m wide shared footway/cycleway to the north of the tunnel, and a 2.5m wide footway to the south of the tunnel. The shared footway/cycleway is also provided on the nearside of Bluewater Pkwy (northbound), up until the toucan crossing at Bluewater Pkwy, connecting to the shared route on the north of Bean Tunnel.

2.3. Vertical Alignment

The vertical alignment of the highway complies with the requirements of CD 109 Revision 1 – Highway Link Design or derived from stopping sight distances from the Manual for Streets, unless noted otherwise within this Departure Report.

The vertical alignment has been designed to enable the new tunnel to be constructed with a minimum vertical clearance of 5.3m plus a 250mm allowance for equipment.

The maximum longitudinal gradient of the highway is 5%. The minimum longitudinal gradient is 0.5%.

2.4. Stopping Sight Distance

The minimum stopping sight distance along highway links is 70m when measured between an eye height of 1.05m and an object height of 0.26m, unless noted otherwise within this Departure Report.

3. Departure reference D/BRT/HI/01

APPLICATION FOR DEPARTURE FROM STANDARDS

Departure ID: **N/A xxxx *[Reference blank as Bean Tunnel is not a Highways England Scheme]***

Road: Bean Tunnel

Scheme: Bean Tunnel

STRUCTURE(S): //

NARIS/PIN Ref: N/A xxxx

Road Section Ref: //

DBFO Ref: //

Agent Ref: Balfour Beatty / Tony Gee

Agent Title: BRT-TG-XX-ZZ- RP-HI-0101 - DfS Ref. D/BRT/HI/01

Structure Name/File Reference: N/A

Designer/Assessor Proposing Departure: Tony Gee

Standards

Volume: DMRB Road Layout Design

Standard: CD 143 Revision 2: Designing for walking, cycling and horse-riding

Clause(s): Table E/1.2

Summary of Departure

The footway proposed to the South of the tunnel has an effective width of 1.5m instead of 2m as outlined in the standards. This is due to the requirement to introduce 0.5m buffer zone from any vertical feature higher than 1.2m, including the tunnel wall, in addition to the 0.5m buffer from the carriageway. As the total with for the facility is 2.5m, a Departure from Standard is proposed to allow the effective width of the facility to be reduced to 1.5m.

It should be noted that the proposed footway does not lie within the desire line for pedestrians, therefore it may be used less than the facility to the North of the tunnel. This reduces the pedestrian traffic on the facility object of this DfS, which mitigates the consequences of reduced capacity. Moreover, the facility is accessible only through an uncontrolled crossing, which reduces the probability of vulnerable users choosing it over the other facility.

Implementing this DfS will allow the design to minimise the excavation area of the tunnel, improving the economic and environmental sustainability impact of the structure.

15.1 Submission

Although the Fastrack bus service will be run regularly for residents and businesses located in new developments (currently Eastern Quarry), two NMUs facilities have been designed to provide an alternative mode of transport for those wishing to walk or cycle. These routes are provided on either side of the tunnel in the form of a 2.5 m wide shared footway/cycleway to the north of the tunnel, and a 1.5m wide footway to the south of the tunnel. The shared footway/cycleway is also provided on the nearside of Bluewater Pkwy (northbound), providing a continuous route linking Bluewater Pkwy to the tunnel. When pedestrians reach the tunnel (when travelling from Bluewater Pkwy), they have a choice of either continuing on the northern side of the tunnel and using the shared route, or they can cross over to the southern side of the tunnel and utilise the footway instead. As the access to the footway is through a uncontrolled crossing and the facility itself doesn't lie along the desire line for pedestrians, it is expected that the majority of the users and of the vulnerable users will prefer using the northern footway/cycleway. As the southern footway

The total width of the footway proposed to the south of the tunnel is 2.5m. There is a vertical feature on one side of the footway higher than 1.2m and that is the tunnel wall, this requires a 0.5m clearance. On the other side of the footway, a separation of 0.5m from the carriageway is also required for roads with speed limits of 40mph or less, which is applicable to the tunnel, that has a speed limit of 30mph. The effective width of the footway excludes these clearance requirements, which results in an effective width of 1.5m.

CD 143 defines the following requirements for walking routes:

- Table E/1.2 indicates that the absolute minimum width when no vertical features are present either side of the footway is 2.0m;
- Table E/1.2 indicates that if a vertical feature is present on one side and is higher than 1.2m, a clearance of 0.5m should be provided on that side of the footway;
- Note E/1.2.1 indicates that on walking routes, the separation from the carriageway should be 0.5m on roads with speed limits of 40mph of less.

A Departure from Standard is required as the effective width of 1.5m is less than the absolute minimum of 2m set out in Table E/1.2.

The following drawings are included in Appendix A to illustrate the proposed highway geometry:

Drawing Number	Drawing Title
B2350500-JAC-DRG-HA-0002	Jacobs Reference Design General Arrangement Plan

15.2 Technical Information / Justification:

The Manual for Streets 2 contains the following recommendations: For guidance on minimum footway width, reference should be made to Department for Transport (2005) Inclusive Mobility document;

Section 3.1 of the DfT Inclusive Mobility guidance states that although a clear width of 2m would allow two wheelchairs to pass one another safely, if this is not possible to provide due to physical

constraints, then 1.5m width could be regarded as the minimum acceptable width under most circumstances. This width gives enough space for a wheelchair user and a walker to pass one another.

Local Transport Note 1/20 – Cycle Infrastructure Design contains the following recommendations: The minimum footway widths recommended in Inclusive Mobility should be retained.

15.2.2 Specialist Information:

Not Applicable

15.3 Secondary Standard:

Not applicable

15.4 Associated Departures:

Not applicable

15.5 Repeat / Similar Departures:

Not applicable

15.6 Bulk Departure: (for Structural Departures only)

Not applicable

15.7 Proposer:

Balfour Beatty / Tony Gee
Matthew Hammonds (Highways Director)
Tony Gee and Partners LLP, Hardy House, 140 High Street, Esher, Surrey, KT10 9QJ, UK.

Tel: +44 (0) 1372461670, Email: Matthew.Hammonds@tonygee.com

Benefits & Justification of Departure

Innovative? N

Added Value? Y

16.1 Benefits:

16.1.i Safety (road users)

A safe NMU provision to the south of the tunnel was considered necessary to provide a safe escape route to passengers in case of vehicle break-down within the tunnel.

Despite the sub-standard width, the footway allows pedestrians to choose between using a pedestrian only route or a shared route. This reduces the pressure on the unsegregated shared route, thus reducing the likelihood of incidents involving NMUs providing an alternative route for pedestrians who may not feel comfortable in using an unsegregated shared use route.

The Manual for Streets 2 refers to Inclusive Mobility for further guidance on footway width. Inclusive Mobility states that a 1.5m wide footway could be regarded as the minimum acceptable width when physical constraints are present.

16.1.ii Safety (construction and maintenance)

The smaller facilities reduce the construction timescale, thus reducing the length of workforce exposure to the risks associated with excavations, works in confined spaces and laying of asphalt.

Similarly, during maintenance, it reduces the exposure of operatives to risks associated with working next to a live carriageway and with re-surfacing activities.

16.1.iii Technical

The smaller excavation volume reduces the risks of affecting the utilities laid in the road above the tunnel and of damaging third party assets.

16.1.iv Programme

The design programme has been developed based upon the layout approved at planning, which included a 2.5m southern footway. The provision of a wider footway will result in a redesign of the tunnel layout and might have to be subject to further scrutiny from the Planning Authority. These two elements would increase the duration of the Programme.

The wider cross-section would be wider than the current proposal and its excavation would increase the duration of the construction programme

16.1.v Budget

The scheme budget has been developed based upon the layout approved at planning, which included a 2.5m southern footway. The provision of a wider footway will result in a redesign of the tunnel layout and might result in increased design costs and has the potential of attracting further costs if the design had to be considered again by the Planning Authority.

The wider tunnel cross-section would result in a higher excavation volume. This would increase the cost of the construction works, as it might extend the construction programme, and the costs associated with disposing of the excavated material.

A wider facility would also attract higher maintenance costs.

16.1.vi Environmental

Increasing the footway would increase the overall emissions from the construction process, as a result of longer use of excavation plants, of higher volume of material to be transported and disposed of offsite, and of the additional asphalt material used for a the wider facility. It would also increase the duration of vibration and noise and disturbance on the local flora and fauna.

A wider facility would also cause higher emissions during the routine resurfacing and maintenance procedures.

16.1.vii Innovation

None

16.1.viii Durability / Maintenance

None

16.1.ix Network Availability

Not applicable

16.2 Impacts:

16.2.i Safety (road users)

The proposed sub-standard effective width might impact on the safety of pedestrian users. It could lead to users stepping into the carriageway to overtake slower moving users and could lead to collisions between users and the tunnel walls. It should be noted that these safety impacts are mitigated, as set out in Section 16.4.

16.2.ii Safety (construction and maintenance)

None

16.2.iii Technical

None

16.2.iv Programme

None

16.2.v Budget

None

16.2.vi Environmental

None

16.2.vii Innovation

None

16.2.viii Durability / Maintenance

None

16.2.ix Network Availability

None

16.3 Risks:

16.3.i Safety (road users)

The proposal introduces two risks for pedestrian users:

1) Users stepping or falling onto the live carriageway while trying to give space to other users
2) Users brushing against the concrete walls while trying to give space to other users

These risks are mitigated, as set out in section 16.4

16.3.ii Safety (construction and maintenance)

None

16.3.iii Technical

None

16.3.iv Programme

None

16.3.v Budget

None

16.3.vi Environmental

None

16.3.vii Innovation

None

16.3.viii Durability / Maintenance

None

16.3.ix Network Availability

None

16.4 Mitigation:

Various mitigations are proposed in order to mitigate the safety impact and risks identified in Sections 16.2.i and 16.3.i:

- 20mph speed limit in the tunnel – this reduces the severity and probability of a collision between a vehicle and any pedestrian that might be on the live carriageway
- Vehicle traffic limited to buses and emergency vehicles – this reduces the probability of collisions between vehicles and pedestrians Use of trief kerbs inside the tunnel, which elevate the footway and shared route above the road surface level by approximately 290mm, and discourage pedestrians from stepping down onto the carriageway
- Signalised crossings effectively located to encourage vulnerable users to use the wider facility to the north

16.5 Overall Justification:

16.5.i Reasons why the Benefits (16.1) outweigh the Impacts (16.2)

The inclusion of a formal footway responds to a need to provide a safe escape route in case of broken down vehicle and increases the overall capacity for active travel.

This proposed departure avoids the need to widen the tunnel cross section and to increase the tunnel excavation volume. A larger excavation would increase the project costs, delay the delivery programme, and increase the construction risks both with regards to operatives H&S and to damages to third party utilities assets.

Considering the scheme layout and the estimate desire line of travel for pedestrians, and in light of the mitigations proposed in section 16.4, increasing the footway width and the consequent tunnel excavation volume would be disproportionate compared to the relatively small benefits it would provide, effectively providing a low cost-benefit ratio.

16.5.ii Reasons why the Risks (16.3) after Mitigation (16.4) are ALARP

The risks arising from this departure, as detailed in section 16.3, cannot reasonably be reduced any further than they have been through the proposed mitigations without increasing the footway width, which, as discussed in the previous paragraph, is not proportional to the benefits obtained.

Therefore, it is considered that the mitigations proposed in paragraph 16.4 have reduced the risks ALARP.

16.5.iii Compatibility with adjacent roads

This Departure from Standard enables continuity to be provided with the footway provision within the Eastern Quarry development

Consultants Comments

None

TAA Comments

Lead Engineer:

TAA Approval

Decision Summary:

The current status of this departure is:

Date:

Appendix A – Supporting Drawings